

# **National Fuel Cell Research Center (NFCRC) University of California, Irvine**

### **MAIN ISSUE OR CHALLENGE**

(1) Develop the fuel cell market; (2) Develop fuel cell technology; (3) Develop the engineering and labor work force; (4) Establish a track record of successful deployment; (5) Establish the needed policy to support the new market

### **GOAL**

To facilitate and to accelerate the development and deployment of fuel cell technology and fuel cell systems

### **OBJECTIVES**

To reach the goal, the NFCRC promotes and supports strategic alliances that address the market challenges associated with the installation and integration of fuel cell systems into the built environment. The NFCRC provides a bridge to the world marketplace and new avenues for developing and applying fuel cell technologies. The NFCRC also offers vital educational opportunities for the general public, industry, undergraduate and graduate students, along with programs extending to grades K-12, and hosts the “Universities for Fuel Cells” initiative in collaboration with the U.S. Department of Defense and the DOE.

### **RELEVANT FACTS**

The NFCRC was dedicated in 1998 by the U.S. Department of Energy (DOE) and the California Energy Commission (CEC) and hosted the first world's demonstration of hybrid fuel cell/gas turbine technology. The NFCRC is equipped with five indoor test cell sites and an outdoor testing platform allocated for the testing and research of grid-connected prototype and pre-commercial fuel cells (e.g., 0.5 to 1,000 kilowatts). The operation of larger units (e.g., 1 to 10 megawatt) occur at “Field Sites” located at the Central Plant (Institutional Field Site), University Research Park (Power Park Field Site), and various business and utility sites (e.g., wastewater treatment plants) in the region.

The NFCRC is focused on: the development of steady-state modeling and dynamic modeling of fuel cells and fuel cell systems; the development of high-temperature, high-efficiency fuel cells; the integration of fuel cells into the built environment, hydrogen infrastructure and fueling; and hybrid combinations of high-

temperature fuel cells and gas turbine to yield unusually high fuel-to-electricity efficiency. The NFCRC operates fuel cell systems from a less than 1 kilowatt (kW) proton exchange membrane to 220 kW solid oxide fuel cell hybrid prototypes.

The NFCRC has also aided the introduction into the U.S. consumer market a Toyota Fuel Cell Hybrid Vehicle and is deploying a hydrogen-refueling infrastructure in California to study and research the hydrogen future. The NFCRC is a co-chair of the California Stationary Fuel Cell Collaborative and facilitates the California Coalition of Fuel Cell Manufacturers.

## ***MAJOR PARTNERS***

### **Agencies**

- U.S. Department Of Energy
- U.S. Department Of Defense
- California Energy Commission
- California Air Resources Board
- South Coast Air Quality Management District

### **Industry**

- Southern California Edison
- Southern California Gas Company
- Toyota
- Parker-Hannifin
- Chevron-Texaco
- Siemens Westinghouse Power Corporation
- Fuel Cell Energy Incorporated
- Horiba Limited
- Capstone Turbine Corporation
- Los Angeles Department Of Water And Power
- Plug Power
- Air Products



*220kW Hybrid Fuel Cell/  
Gas Turbine Demonstration*